

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Atty. Docket: **STADELE-2**

In re Application of:
Norbert STÄDELE

Appln. No.: 10/805,337

Filed: March 22, 2004

For: CORRUGATING MACHINE AND
METHOD FOR THE

) Conf. No.: 9096

) Art Unit: 1733

) Examiner: MUSSER, BARBARA J.

) Washington, D.C.

) December 3, 2007

DECLARATION OF NORBERT STÄDELE

I, Norbert Städele, Tulpenweg 3, D-92711 Parkstein, Federal Republic of Germany, to my best knowledge declare the following:

1. I am the sole inventor of an invention which has been filed with the US Patent and Trademark Office as a patent application Ser. No. 10/805,337 on March 22, 2004, claiming the priority of the first application Ser. No. 103 12 600.7 in Germany of March 21, 2003.
2. I am fully experienced in the design and manufacturing of machines for the manufacture of sheets of corrugated board and have been working in this field as Chief Technical Officer since 1998. I believe myself to be a person ordinarily skilled in the art of manufacturing sheets of corrugated board, based on my 10 years working in this field.

Furthermore, I am familiar with the prior art cited by the US PTO with respect to my aforementioned invention. In particular I am familiar with the patent application WO 2004/041 541 A1 to Aldén, the US patent 4,587,898 to Welschlaui, the US patent 6,491,361 to Spann, the US patent 5,658,432 to Heaven and the patent application WO 02/084 008 A2 by Panebianco. Furthermore, I have studied the complete file of US 10/805,337 and in particular the EXAMINER'S OFFICE ACTION of September 24, 2007.

3. Methods for the manufacture of sheets of corrugated board are well known. Further-

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more, there is a frequent demand for printed sheets of corrugated board. One problem in this respect is that during manufacture the corrugated board shrinks, which leads necessarily to an unwanted change of the dimension and shapes of the imprinted patterns.

4. The application according to my invention solves this problem by determining the degree of shrinkage based on the ratio of distances between marks, determining scaling factors for the printing patterns accordingly, digitally imprinting suitably scaled printing patterns onto the sheets of corrugated board and cutting the sheets of corrugated board in accordance with the shape and size of the imprinted patterns.
5. Within the prior art cited by the Examiner only Welschlau discloses a machine for manufacturing corrugated paper. However, Welschlau does not address the problem of shrinkage and, accordingly, does not disclose anything about determining scaling factors for the printing patterns. In fact, as the machine disclosed by Welschlau uses a rotary printing machine (see col. 1, line 15), the continuously scaling of the printing pattern according to a continuously monitored degree of shrinkage would not be possible, since a rotary printing machine has to be provided with pre-fabricated printing forms. Consequently, continuously scaling the printing pattern in an in-line process is not possible with a rotary printing machine. Even more, since the rotary printing machine disclosed by Welschlau consists of several printing stations adjacent to each other and several printing stations in sequence, which must print one over the other (col. 4, lines 14 et seq.) the problem to be solved by Welschlau is to adjust the printing stations such that the printed pictures can be printed upon the advancing paper web in proper relationship to one another and over one another (col. 4, lines 33 to 37). This is accomplished by shifting of the carrier bands relative to one another (col. 4, line 66 - col. 5, line 30). Clearly, this can only work in the absence of any shrinkage. If there was any shrinkage the carrier bands with suitably scaled printing forms would also have to be continuously adjusted relative to each other along the direction of the width of the paper web to make printing the same picture several times in proper relationship to one another and over one another possible at all. Welschlau does not address this issue as he does not address the problem of shrinkage.

Thus, Welschlau does not teach me anything about avoiding an unwanted change of the shapes of the printed patterns due to shrinkage of the sheets.

Only with a digital printing method in accordance with my invention it is possible to flexibly scale a printing pattern with scaling factors, which are determined depending on a continuously monitored, varying degree of shrinkage of the corrugated web being

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produced. With conventional, previously known printing methods, such as rotary printing, printing forms have to be pre-fabricated rendering a continuous, flexible scaling impossible. In agreement with conventional paper making machinery Welschlau discloses the use of a rotary printing machine. Welschlau does not teach me any reason why I should replace such a rotary printing machine by a digital printer.

6. Actually, none of the prior art cited by the Examiner discloses the determination of scaling factors for printing patterns:

Aldén and Spann do not even address the issue of shrinkage. They do not pertain to a method for the manufacture of corrugated boards. In fact, Aldén does not use a heater, so there is no shrinkage involved. Accordingly, they do not teach me anything about determining and applying a scaling factor to a printing pattern to account for shrinkage.

Heaven discloses a method for determining cross-machine shrinkage in a papermaking machinery. Heaven uses the determined shrinkage profiles to allow for better shrinkage modelling within each grade of paper being produced (see, e.g., col. 4, lines 40-53). Heaven does not concern printing at all. Consequently, Heaven does not disclose determining scaling factors so that the desired size of a printing pattern will appear on the web, as in my invention. Furthermore, Heaven does not teach me anything about the determination of a shrinkage factor along the length of the sheet because it does not need this information to measure defects in the sheets. It only measures along the cross-direction of the web.

7. Heaven does not disclose a corrugating machine which comprises at least two unroll stands for unwinding continuous webs of material or processing equipment for producing at least one web of corrugated board from the webs of material. Thus, Heaven cannot and does not teach how to determine sheet shrinkage in a corrugating machine according to my invention.

Furthermore, since Heaven does not concern printing, he does not teach me to determine scaling factors for the printing patterns or, indeed, replacing a conventionally used rotary printer by a digital printing method. Thus, even a combination of Welschlau and Heaven would not teach me to use a digital printing method instead of the rotary printing machine used by Welschlau in agreement with conventional papermaking machinery.

Finally, Heaven does not teach me to cut the sheets of corrugated board in accordance

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with the shape and size of digitally imprinted patterns.

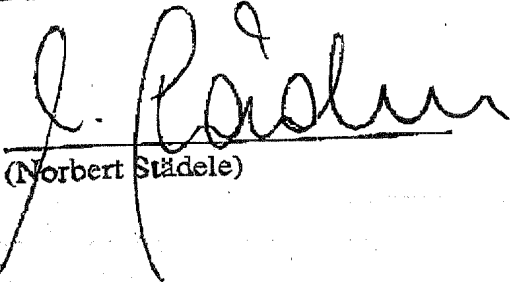
In summary, whilst Heaven discloses a method for determining cross-machine shrinkage, he does not address the problem of avoiding an unwanted change of the shape of imprinted patterns due to shrinkage during the manufacturing process of corrugated board, which is the object of my invention.

8. Panebianco concerns the shrinkage of textiles during washing. Panebianco teaches how to measure fabric, wash it, and account for shrinkage by increasing the size of the fabric specification (page 7, lines 10-12), then, based on the users inputting of enlarged garment specifications into the device (page 11, lines 7-9), cutting more fabric so that the cut garment matches the original, pre-shrunk, size specified by the designer (page 8, lines 14-19). This is totally unrelated to my invention. Panebianco does not concern a machine for manufacturing corrugated board or, indeed, printing at all. As a consequence he does not teach me anything about applying a scaling factor to a printing pattern to be printed on a sheet of corrugated board. As Panebianco does not disclose a method for the manufacture of sheets of corrugated board nor a corrugating machine nor any printing at all it cannot contribute anything to the solution of the above mentioned problem. It is not clear to me how a method for determining shrinkage of cloth fabrics due to washing as disclosed by Panebianco could teach me anything about the manufacture of imprinted sheets of corrugated board. The Office Action asserts that Panebianco discloses using the scaling factors so that the final article is the desired size. The way that Panebianco does this is by changing the size of the cutting instructions given to the machine so that the fabric cut-outs used to form the garment are larger, to account for the shrinkage expected during washing. Panebianco does not suggest to me that I should, nor provide a way that I could, modify Alden, Welschlaue and Heaven to determine scaling factors so that the desired size of the printing patterns will appear on the web, as provided for in my invention.
9. The undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Place: Parkstein

Date: 08.12.2007

A handwritten signature in black ink, appearing to read 'N. Städele', written over a horizontal line.

(Norbert Städele)